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(54) Ink-jet recording medium.

(57) A recording medium for ink-jet printing which comprises an ink-receiving layer provided on a poly(olefin)-coated paper substrate in which the ink-receiving layer comprises at least one hydrophilic resin. The recording medium is capable of recording clear, brilliant, glossy color images of high image density comparable in look and feel to conventional photographic prints.

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The present invention relates to an opaque recording medium suitable for ink-jet recording. More particularly, the present invention relates to an opaque recording medium suitable for ink-jet recording capable of recording clear, brilliant, glossy color images of high image density comparable in look and feel to conventional color photographic prints, as well as to a method of ink-jet recording employing the recording medium.

In ink-jet recording, numerous schemes may be utilized to control the deposition of ink droplets on the image-recording medium to yield the desired image. In one process, known as continuous ink-jet recording, a continuous stream of droplets is charged and deflected in an imagewise manner onto the surface of the image-recording medium, while unimaged droplets are caught and returned to the ink sump. In another process, known as drop-on-demand ink-jet recording, individual ink droplets are projected as needed onto the image-recording medium to form the desired image. Common methods of controlling the projection of ink droplets in drop-on-demand printing include piezoelectric transducers and thermal bubble formation. Ink-jet recording is rapidly gaining acceptance by the public as a recording method which generates little noise and permits economical and multi-color printing.

As the ink for ink-jet recording, there are mainly used aqueous inks which meet the requirements for safety and recording characteristics, and these inks contain, in many cases, a polyhydric alcohol or the like for preventing nozzle plugging and enhancing discharging stability.

As the recording medium for ink-jet recording, there have conventionally been used ordinary papers and so-called ink-jet recording papers comprised of a substrate and an ink-receiving layer formed on the substrate. In fact, most of the recording media for surface image observation of the prior art have employed a system in which a porous ink-receiving layer is provided on the surface of a substrate, for example, paper, and the recording agent is fixed by permitting the ink to be received into the porous voids of the receiving layer. One such type of porous ink-receiving layer which has been used in ink-jet recording systems is comprised of a pigment-filled, water-soluble, hydrophilic resin or polymer having a high degree of ink absorbency. Examples of such polymers include various naturally occuring water-soluble, hydrophilic resins such as albumin, gelatin, casein, starch, cationic starch, gum arabic, sodium alginate and various synthetic water-soluble, hydrophilic resins such as poly(vinyl alcohol), poly(amide), poly(acrylamide), poly(vinylpyrrolidone), quaternary poly(vinylpyrrolidone), poly(ethylene imine), poly(vinylpyridium halide), melamine resins, polyurethanes, polyesters, carboxymethyl cellulose, poly(vinyl formal), poly(methyl methacrylate), poly(vinyl butyral), and the like. Such resins have been described extensively in the prior art including, for example, in US-A-4,868,581 and US-A-4,956,223.

In general, when such media as ordinary paper and the ink-jet recording papers described above are imaged with inks, good quality text and graphic images can be generated. However, when photographic images are printed with the same inks on such recording media, the images are of relatively poor quality when compared to conventional photographic prints. Most notably, there is a lack of surface gloss and substrate opacity.

For example, in US-A-5,141,599, there is disclosed an opaque paper-based receiving material for ink-jet printing which comprises a poly(olefin)-coated base paper overcoated with an ink-receiving layer which contains a mixture of gelatin and starch. Reportedly, these receiving materials exhibit high surface gloss, good color density and are smudge resistant. Although such receiving materials, when pictorially imaged with an ink-jet printing device, produce images that approach conventional photographic prints in appearance and feel, the images that are produced thereon are still not of the same high image quality that is customarily expected from and exhibited by photographic prints.

In addition to the problems set forth above, recording media of the type aforedescribed which comprise a porous, ink-receiving layer coated onto the surface of a paper support typically are prepared by applying to the paper support or substrate an aqueous and/or organic solvent (for example, methanol or ethanol) solution or dispersion of the polymeric material or resin by conventionally known methods such as, for example, by means of a blade coater, a knife coater, a gravure coater or a curtain coater and dried to form a layer on the paper support. When such recording media are formed by this method, the propensity of the aqueous and/or solvent coating solution or dispersion to penetrate the fibrous structure of the paper produces a non-uniform ink-receiving layer having a non-glossy or differentially glossy surface. By non-uniform it is meant that the ink-receiving layer is uneven in that some areas of the layer are thicker than others. Another problem associated with this method of application is the propensity of the paper to curl and/or cockle due to the large amount of water and/or solvent which it absorbs during the coating process thereby causing the coated paper to become deformed in a wavy or undulating fashion resulting in a lowering of image quality. Also, when recording is performed by the use of a printer having a plural number of recording heads, the convex portion formed by cockling will contact the head during recording thereby clogging the head or smudging the image. A still further problem inherent in this process is the propensity of the paper to tear easily during the coating process due to the large amount of water and/or solvent which it absorbs during the coating process.

For this and other reasons, a need exists for the provision of an opaque, paper-based image recording

medium suitable for imaging with an ink-jet recording device such as an ink-jet printer which is capable of yielding high quality photographic images which are comparable in image density, opacity, surface gloss color gamut (that is, range of colors) and feel to conventional photographic prints.

To solve the above-mentioned problems, an ink-receiving layer comprised of a synthetic, hydrophilic resin or mixture of such resins is applied to a poly(olefin)-coated base paper to form an ink-jet recording medium. The opaque recording medium thus formed is capable of rendering color pictorial images that have the look and feel of conventional photographic prints. Further, the presence of the poly(olefin)-coating on the paper substrate prevents any water and/or solvent present in the ink-receiving layer from penetrating the paper substrate during the process of coating the ink-receiving layer onto the paper substrate. This in turn prevents the paper from curling, cockling or tearing during the coating process.

Thus, in accordance with the present invention, there is provided a recording medium for ink-jet printing which comprises a support material including a poly(olefin)-coated base paper and an ink-receiving layer which comprises a synthetic, hydrophilic resin coated over the poly(olefin)-coated base paper.

In accordance with a further embodiment of the present invention, there is provided an ink-jet recording method which comprises applying droplets of an ink on a recording medium wherein the recording medium comprises a support material including a poly(olefin)-coated base paper and an ink-receiving layer which comprises a synthetic, hydrophilic resin coated over the poly(olefin)-coated base paper.

The recording medium of the present invention generally comprises a support material and an ink-receiving layer coated over the support material. The ink-receiving layer or ink-absorbent layer comprises any suitable synthetic, hydrophilic ink-receptive resin or polymer, or a blend of such resins or polymers, which can be coated onto the support material to yield an absorbent layer capable of being imaged by an ink-jet printing device. The support material comprises a poly(olefin)-coated paper.

The term "hydrophilic," as used herein, is used to describe a material that is generally receptive to water, either in the sense that its surface is wettable by water or in the sense that the bulk of the material is able to absorb significant quantities of water. More specifically, materials that exhibit surface wettability by water are said to have hydrophilic surfaces, while materials that have surfaces that are not wettable by water are said to have hydrophobic surfaces. The term "synthetic, hydrophilic resin or polymer," as used herein, is used to describe a non-naturally occuring resin or polymer that is capable of absorbing significant quantities of water. Examples of suitable synthetic, hydrophilic resins include poly(vinyl alcohol), poly(amide), poly(vinylpyrrolidone), poly(acrylamide), poly(ethyleneimine), poly(vinylpyridinium halide), melamine resins, polyurethanes, polyester ionomers, carboxymethyl cellulose, poly(alkylene oxides) containing from 2 to 6 carbon atoms, and salts of polyacrylic acid. Specifically excluded are naturally occurring hydrophilic resins such as albumin, gelatin, casein, starch, cationic starch, gum arabic, sodium alginate, and the like which have been found to be inferior to the ink-receiving layers used in the recording media of the present invention in terms of being able to record photographic images having the same quality and feel as conventional photographic prints. Further, it was found that when such naturally occurring resins were coated over a poly(olefin)-coated paper substrate and used as a recording medium to record photographic images, the ink-receiving layer was prone to smudging and offset of the ink from the surface of the recording media onto the backside of another recording media superposed over the imaged recording media - even several days after the image was first printed.

A particularly suitable ink-receiving layer for use in the recording media of the present invention is a layer which is coated onto the poly(olefin)-coated base paper as an aqueous dispersion of a polyester ionomer, namely a poly(cyclohexylenedimethylene isophthalate-co-sodiosulfobenzenedicarboxylate) dispersed in a vinyl pyrrolidone polymer as disclosed in US-A-4,903,040.

Another particularly suitable ink-receiving layer for use in the recording media of the present invention is a layer which is coated onto the poly(olefin)-coated base paper as an aqueous dispersion of a polyester ionomer, namely a poly(cyclohexylenedimethylene-co-oxydiethylene isophthalate-co-sodio-sulfobenzenedicarboxylate), dispersed in a vinyl pyrrolidone polymer as disclosed in US-A-4,903,039.

Still another particularly suitable ink-receiving layer for use in the recording media of the present invention is a layer which is coated onto the poly(olefin)-coated base paper as an aqueous dispersion of a polyester ionomer, namely a poly[cyclohexylenedimethylene-co-xylylene terephthalate-co-malonate-co-sodioiminobis-(sulfonylbenzoate)] dispersed in a vinyl pyrrolidone polymer as disclosed in US-A-4,903,041.

Particularly preferred ink-receiving layers for use in the recording media of the present invention are layers which are coated onto the poly(olefin)-coated base paper as an aqueous dispersion of 60 to 70 weight percent of a water-dispersible polyester ionomer of the type disclosed and described in above mentioned US-A-4,903,039; US-A-4,903,040 and US-A-4,903,041, 25 to 30 weight percent of poly(vinyl pyrrolidone), 0 to 5 weight percent of a homopolymer or a copolymer of an alkylene oxide containing from 2 to 6 carbon atoms and 0 to 5 weight percent of poly(vinyl alcohol). The polymerized alkylene oxide components constitute nonionic surface active polymers including homopolymers and copolymers of an alkylene oxide in which alkylene

refers to carbon linkages such as ethylene, propylene, butylene and the like and are characterized by molecular weights of from 100,000 to 5,000,000 weight average molecular weight. Poly(ethylene oxide) is a particularly preferred poly(alkylene oxide).

The ink-receiving layers used in the recording media of the present invention can incorporate various known additives, including matting agents such as titanium dioxide, zinc oxide, silica and polymeric beads such as crosslinked poly(methyl methacrylate) or polystyrene beads for the purposes of contributing to the non-blocking characteristics of the recording media of the present invention and to control the friction and/or finger print resistance thereof; surfactants such as non-ionic, hydrocarbon or fluorocarbon surfactants or cationic surfactants, such as quaternary ammonium salts for the purposes of improving the aging behavior of the ink-absorbent resin or layer, promoting the absorption and drying of a subsequently applied ink thereto, enhancing the surface uniformity of the ink-receiving layer and adjusting the surface tension of the dried coating; fluorescent dyes; pH controllers; antifoaming agents; lubricants; preservatives; viscosity modifiers; dye-fixing agents; waterproofing agents; dispersing agents; UV absorbing agents; mildew-proofing agents; antistatic agents, and the like. Such additives can be selected from known compounds or materials in accordance with the object.

The ink-receiving layer is conveniently applied to the support material by deposition from a solution or dispersion of the synthetic, hydrophilic resin or polymer, and other additives as mentioned above if desired, in a volatile medium, such as an aqueous or organic solvent medium in accordance with known coating procedures such as immersion or dip coating, roll coating, reverse roll coating, air knife coating, doctor blade coating, bead coating and curtain coating, followed by drying as rapidly as possible with a drier such as a hot-air dryer, a hot-air oven, a hot drum or the like.

The ink-receiving layer may have a dry thickness sufficient for absorbing and capturing the recording liquid or ink, which may range, though variable depending on the amount of recording liquid, from 1 to 30 micrometers, preferably from 5 to 20 micrometers.

The poly(olefin) used in the coating of the base paper should preferably be of the low density poly(ethylene) (LDPE) and/or the high density poly(ethylene) (HDPE). However, other polyolefins, such as poly(propylene) also may be utilized. The coating thickness of the poly(olefin) layer, in which other known additives for enhancing its physical and optical properties such as surfactants, optical brighteners, plasticizers, anti-oxidants, light stabilizers and the like may be included, should be from 6 to 65 micrometers, preferably 10 to 40 micrometers.

The poly(olefin) layer prevents the solvent from the ink-receiving layer from penetrating the pores and fibers of the paper substrate in the support material and allows for a more uniform, predictable coating of the ink-receiving layer onto the poly(olefin)-coated base paper, especially when widely different types of papers are used as a component of the support material. The poly(olefin) layer also prevents the paper from tearing due to the large amount of water and/or organic solvent it would otherwise absorb without the presence of the poly(olefin) layer or coating positioned between the ink-receiving layer and the paper as taught herein during the coating process of the ink-receiving layer onto the support material. Further, the presence of the poly(olefin) layer prevents the paper from curling and/or cockling due to the large amount of water and/or organic solvent which it would otherwise absorb during the coating process. Still further, the presence of the poly(olefin) layer in combination with the ink-receiving layer in the recording media of the present invention has been found to produce clear, brilliant, glossy color images comparable in quality to conventional color photographic prints. The poly(olefin) layer may be applied by any one of well-known methods, such as solvent coating or melt-extrusion, but is preferably applied by melt-extrusion coating techniques.

The paper component of the recording media of the present invention can be any high quality paper including synthetic paper. The thickness of the paper should be in the range of from 50 to 500 micrometers. If the thickness of the paper to be used is less than the above range, the stiffness of the paper obtained is weak, posing a problem in conveyance within the printer during printing. Optionally, an additional backing layer or coating can be applied to the backside (that is, uncoated) surface of the paper for the purposes of improving the machine-handling properties of the recording medium, controlling friction and resistivity and the like. Typically, the backing layer comprises a binder and a filler. Typical fillers include amorphous and crystalline silicas, poly(methyl methacrylate), hollow sphere polystyrene beads, micro crystalline cellulose, zinc oxide, talc and the like. The filler loading in the backing layer is generally less than 2 percent by weight of the binder component and the average particle size of the filler material is in the range of 10 to 30 micrometers and preferably 15 to 20 micrometers. Typical of the binders used in the backing layer are polymers that are not water absorptive, such as acrylates, methacrylates, polystyrenes and poly(vinyl chloride)-poly(vinyl acetate) copolymers. Additionally, an antistatic agent also can be included in the backing layer to prevent static hindrance of the recording media. Particularly suitable antistatic agents are compounds such as dodecylbenzenesulfonate sodium salt, octylsulfonate postasium salt, oligostyrenesulfonate sodium salt, dibutylnaphthalenesulfonate sodium salt, laurylsulfosuccinate sodium salt and the like.

The antistatic agent is added to the binder composition in an amount of 0.1 to 15% by weight based on the weight of the binder.

When the amount of the antistatic agent is too small, the antistatic effect is hardly realized. On the other hand, when the amount is too large, it results in adhesion problems.

If desired, an adhesion promoting priming layer can be interposed between the poly(olefin)-coated paper support material and the ink-receiving layer to improve the adhesion of the ink-receiving layer to the poly(olefin)-coated paper support material. Such adhesion promoting layers can include chemical priming coatings and surface treatments, such as corona treatment. Corona treatment is presently preferred. Examples of conventional materials known in the art for forming a priming layer include halogenated phenols or partially hydrolyzed vinyl chloride-vinyl acetate copolymers. Such a copolymer conveniently contains from 60 to 98 percent of vinyl chloride and from 0.5 to 3 percent of hydroxyl units, by weight, of the copolymer. The molecular weight (number average molecular weight) of the copolymer is in a range of from 10,000 to 30,000 and preferably from 16,500 to 25,000.

The priming agent is suitably applied at a concentration level which will yield a priming layer having a relatively thin dry coat thickness -- for example, generally less than 2, and preferably less than 1 micrometer.

The recording media of the present invention can have the ink-receiving layer thereof overcoated with an ink-permeable, anti-tack protective layer, such as, for example, a layer comprising poly(vinyl alcohol), hydroxymethyl cellulose, hydroxyethyl cellulose, hydroxypropylmethyl cellulose, carboxymethyl cellulose and the like. The overcoat layer or topcoat layer also can provide surface properties to aid in properly controlling the spread of the ink droplets to improve image quality. The ink permeable layer having the functions as described above can be accomplished by forming a thin film of 10 micrometers or less, preferably 0.01 to 3 micrometers, of the polymeric material.

In practice, various additives may be employed in the coatings of the overcoat. These additives include surface active agents which control wetting or spreading action of the coating mixture, antistatic agents, suspending agents, particulates which control the frictional properties or act as spacers for the coated product.

The inks used to image the recording media of the present invention are well-known inks. The ink compositions used in ink-jet printing are typically liquid compositions comprising a solvent or carrier liquid, dyes or pigments, humectants, organic solvents, detergents, thickeners, preservatives and the like. The solvent or carrier liquid can be predominantly water, although inks in which organic material such as polyhydric alcohols are the predominant carrier or solvent liquid also are used. Particularly useful are mixed solvents of water and polyhydric alcohols. The dyes used in such compositions are typically water-soluble direct or acid type dyes. Such liquid ink compositions have been described extensively in the prior art including for example, US-A-4,381,946; US-A-4,239,543 and US-A-4,781,758.

The invention is further illustrated by reference to the following examples.

EXAMPLES 1-4

Four different paper supports described in Table 1 below were coated with an aqueous coating composition comprising 6.59 wt% poly[1,4-cyclohexylenedimethylene-co-p-xylylene (40/60) terephthalate-co-malonate-co-3,3'-sodioiminobis (sulfonylbenzoate)] (obtained from Eastman Chemical Company as AQ38S), 2.83 wt% poly(vinyl pyrrolidone) (supplied by BASF Corporation under the tradename Kollidon 90), 0.2 wt% poly(ethylene oxide) (obtained from Aldrich Chemical Company), 0.2 wt% poly(vinyl alcohol) (sold by Air Products and Chemicals under the tradename AIRVOL 325), 0.07 wt% poly(methyl methacrylate-co-divinylbenzene) particles having an average particle size of 15 micrometers, 0.11 wt% propylene glycol butyl ether (obtained from Union Carbide Corporation under the tradename Propasol-B), and 90.0 wt% distilled water at a dry laydown coverage of 16 g/m^2. Drying of the layer was conducted by means of heated air at a temperature of 100°C for 5 minutes. All supports were corona discharge-treated just prior to application of the coating solution.

Table 1

Example No.	Paper Support
1	6.6 mils (170 micrometers) paper coated on the face (view side) with 1.28 mils (32.5 micrometers) poly(ethylene) and on the wire (back) side with 1.38 mils (35.1 micrometers) of an antistatic layer
2	5.0 mils (130 micrometers) paper coated on the face side with 0.7 mil (20 micrometers) barium sulfate/gelatin layer (Baryta) and no wire side coating
3	3.2 mils (81 micrometers) paper coated on the face side with 1.1 mils (28 micrometers) poly(ethylene) and on the wire side with 1.2 mils (30 micrometers) of an antistatic layer
4	3.2 mils (81.3 micrometers) paper coated on the face side with 0.46 mil (12 micrometers) poly(ethylene) and on the wire side with 0.64 mil (16 micrometers) of an antistatic layer

Examples 1, 3 and 4 which possessed poly(ethylene) layers between the paper support material and the ink-receiving layer to prevent the water present in the ink-receiving layer from penetrating into the paper resulted in smooth, glossy, defect-free coatings with no tearing of the paper support material. Example 2, however, which possessed a barium sulfate/gelatin layer coated on the face side of the paper support with no poly(olefin) layer being present was unable to prevent penetration of the water from the ink-receiving layer into the paper, resulting in a wavy, cockeled coating which was observed to be quite fragile until completely dry. This shows that an appropriate poly(olefin) layer is necessary to achieve high quality coating of the ink-receiving material on the support material.

COMPARATIVE EXAMPLE 5

Each of the supports of examples 1 through 4 and four commercially avialable opaque ink-jet recording media representative of prior art recording media currently being used in ink-jet recording processes and designated hereafter as recording media A, B, C and D were imaged with a Hewlett-Packard Desk Writer 550C 4-color ink-jet printer and the images recorded thereon were evaluated by visual observation against the following criteria: opacity, gloss, feel, and overall image quality. For each of these criteria, the images were ranked on a scale of 1 to 3, with 3 signifying the closest match to conventional photographic prints and 1 signifying the worst match to conventional photographic prints. The same image was used in each case and consisted of a photo CD 4-base image printed at a 4-inch (10.16 cm) by 6-inch (15.24 cm) aspect ratio. The results are summarized in Table 2 below.

Table 3

Recording Media	OPACITY	GLOSS	FEEL	IMAGE QUALITY
Ex. No. 1	3	3	3	3
Ex. No. 2	3	3	3	2
Ex. No. 3	2	3	2	3
Ex. No. 4	2	3	2	3
A[1]	1	1	1	1
B[2]	2	1	1	2
C[3]	2	2	1	2
D[4]	2	3	2	2

1. An uncoated ink-jet grade paper sold under the tradename Legacy by the Strathmore Paper Company, West Springfield, Massachusetts
2. A mineral-coated ink-jet paper sold under the tradename HP CX JetSeries CutSheet Paper by the Hewlett-Packard Company, Camas, Washington
3. A coated opaque ink-jet film sold under the tradename HP LX JetSeries Glossy Paper by the Hewlett-Packard Company, Camas, Washington
4. A gelatin-coated ink-jet paper sold under the tradename NovaJet II Photographic Glossy Premium Ink Jet Media by Encad Corporation, San Diego, California

The results in Table 3 shows that the recording media of the present invention, when pictorially imaged with an ink-jet printing device, produce images that are more like conventional photographic prints than comparative prior art recording media.

It was further observed that recording medium D, the gelatin-coated paper, was prone to smudging and offset of the ink from the surface of the print onto the back of a print superposed over it occurred - even several days after the image was first printed.

Thus, the invention provides an opaque, paper-based image recording medium suitable for being imaged by an ink-jet recording device such as an ink-jet printer which is capable of recording high quality images which are comparable in image density, opacity, surface gloss, color gamut and feel to conventional photographic prints.

Claims

1. A recording medium for ink-jet printing which comprises a support material including a poly(olefin)-coated base paper and an ink-receiving layer which comprises a synthetic, hydrophilic resin coated over the poly(olefin)-coated base paper.
2. A recording medium as claimed in claim 1, wherein the synthetic, hydrophilic resin is poly(vinyl alcohol).
3. A recording medium as claimed in claim 1, wherein the synthetic, hydrophilic resin is poly(vinylpyrrolidone).
4. A recording medium as claimed in claim 1, wherein the ink-receiving layer comprises a polyester dispersed in a vinylpyrrolidone polymer wherein the polyester is a poly(cyclohexylenedimethylene isophthalate-co-sodiosulfobenzenedicarboxylate).

5. A recording medium as claimed in claim 1, wherein the ink-receiving layer comprises a polyester dispersed in a vinylpyrrolidone polymer wherein the polyester is a poly(cyclohexylenedimethylene-co-oxydiethylene isophthalate-co-sodiosulfobenzenedicarboxylate).

6. A recording medium as claimed in claim 1, wherein the ink-receiving layer comprises a polyester dispersed in a vinylpyrrolidone polymer wherein the polyester is a poly[cyclohexylenedimethylene-co-xylylene terephthalate-co-malonate-co-sodioiminobis(sulfonylbenzoate)].

7. A recording medium as claimed in claim 1, wherein the ink-receiving layer is coated onto the poly(olefin)-coated base paper as an aqueous dispersion of 60 to 70 weight percent of poly(cyclohexylenedimethylene isophthalate-co-sodiosulfobenzenedicarboxylate), 25 to 30 weight percent of poly(vinyl pyrrolidone), 0 to 5 weight percent of a homopolymer or a copolymer of an alkylene oxide containing from 2 to 6 carbon atoms and 0 to 5 weight percent of poly(vinyl alcohol).

8. A recording medium as claimed in claim 1, wherein the poly(olefin) is low density poly(ethylene).

9. A recording medium as claimed in claim 1, wherein the poly(olefin) is high density poly(ethylene).

10. A recording medium as claimed in claim 1, wherein the poly(olefin) is a mixture of low density poly(ethylene) and high density poly(ethylene).

11. A recording medium as claimed in claim 1, wherein the poly(olefin) is poly(propylene).

12. A recording medium as claimed in claim 1, wherein the dry coating thickness of the ink-receiving layer is from 1 to 30 micrometers.

13. A recording medium as claimed in claim 1, wherein the poly(olefin) coating thickness is from 6 to 65 micrometers.

14. A recording medium as claimed in claim 12, wherein the thickness of the ink-receiving layer is from 5 to 20 micrometers.

15. A recording medium as claimed in claim 13, wherein the thickness of the poly(olefin) is from 10 to 40 micrometers.

16. A recording medium as claimed in claim 1, wherein the thickness of the paper in the support material is from 50 to 500 micrometers.

17. A recording medium as claimed in claim 1, comprising at least one priming layer between the poly(olefin)-coated base paper and the ink-receiving layer.

18. An ink-jet recording method which comprises applying droplets of a predominantly aqueous ink onto a recording medium, the recording medium comprising a support material including a poly(olefin)-coated base paper and an ink-receiving layer comprising a synthetic, hydrophilic resin coated over the poly(olefin)-coated base paper.

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EUROPEAN SEARCH REPORT

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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X Y Y	EP-A-0 514 633 (SCHOELLER FELIX JUN PAPIER) 25 November 1992 * page 3, line 32 - line 34; example 2 *	1,2,17, 18 3-7,12, 14 8-11	B41M5/00
Y	WO-A-93 04870 (EASTMAN KODAK CO) 18 March 1993 * page 15, line 28; claims *	3,4,7, 12,14	
Y	WO-A-93 04869 (EASTMAN KODAK CO) 18 March 1993 * page 15, line 34; claims *	3,5,12, 14	
Y	WO-A-93 04871 (EASTMAN KODAK CO) 18 March 1993 * page 15, line 31; claims *	3,6,12, 14	
Y	EP-A-0 539 678 (SCHOELLER FELIX JUN PAPIER) 5 May 1993 * page 3, line 34 - line 42 *	8-11	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A	DATABASE WPI Section Ch, Week 8731 Derwent Publications Ltd., London, GB; Class A97, AN 87-216401 & JP-A-62 141 194 (SANYO KOKUSAKU PULP) , 24 June 1987 * abstract *	1,2,18	B41M
P,X	EP-A-0 586 846 (MITSUBISHI PAPER MILLS LTD) 16 March 1994 * example 1 *	1,2, 8-11,13, 15,17,18	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	20 December 1995	Bernardo Noriega, F

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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